Draft Aquatic Life Ambient Water Quality Criteria Cadmium -2015

PUBLIC RELEASE DATE: Monday, November 30, 2015*

ACTION: EPA is requesting public comment on a draft version of the updated national recommended aquatic life water quality criteria for cadmium.

ANTICIPATED REACTION:

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MATERIALS:

- Desk Statement
- Stakeholder notification list
- Water Headline entry
- Questions and Answers for Press Office
- Fact Sheet

DESK STATEMENT:

EPA is requesting public comment on draft water quality criteria for aquatic life for the metal cadmium. Chronic exposure to cadmium negatively impacts growth, development, behavior, reproduction, and immune and endocrine systems in aquatic life. Mining and urbanization are responsible for approximately 90 percent of the cadmium found in surface waters.

The draft cadmium water quality criteria reflect the best available science, including the results of new laboratory aquatic toxicity tests. The draft criteria has undergone an external peer review that was completed in 2015. EPA will accept public comments on the draft criteria for 60 days after publication in the Federal Register. EPA will consider the comments and revise the criteria. Once finalized, EPA's water quality criteria for cadmium will provide recommendations to states and tribes authorized to establish water quality standards under the Clean Water Act. More information: http://www.epa.gov/wqc/aquatic-life-criteria-cadmium

ROLL-OUT SCHEDULE

11/24/15 - 11/27/15	Key EPA and stakeholder notifications via phone (list below).
11/30/15 or 12/1/15	Other EPA and stakeholder notifications via email (list below). Web content goes live. *(*If FRN will publish on 11/30 or 12/1, we will link to it and the docket materials, and webpost the fact sheet. If the FRN is not projected to publish by then, we will webpost a pre-publication version on 11/30 along with the criteria document, peer review comments and fact sheet.)*

NOTIFICATIONS

Communication by: Betsy Behl, Director, Health and Ecological Criteria Division

Upon Signature (expected 11/24/15):

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Upon FRN Publication (expected 11/30/15):

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WATER HEADLINES:

EPA is requesting public comment on draft water quality criteria for aquatic life for the metal cadmium. Chronic exposure to cadmium negatively impacts growth, development, behavior, reproduction, and immune and endocrine systems in aquatic life. Mining and urbanization are responsible for approximately 90 percent of the cadmium found in surface waters. The draft cadmium water quality criteria reflect the best available science, including the results of new laboratory aquatic toxicity tests. The draft criteria underwent an external peer review that was completed in 2015. EPA will accept public comments on the draft criteria for 60 days after publication in the Federal Register. Once finalized, EPA's criteria for cadmium will provide recommendations to states and tribes authorized to establish water

quality standards under the Clean Water Act. Learn more

QUESTIONS & ANSWERS:

1) What are National Recommended Aquatic Life Criteria?

Ambient water quality criteria for the protection of aquatic life are numeric concentrations of pollutants, with specific recommendations on the duration and frequency of those concentrations, in surface waters that are protective of aquatic life designated uses. Under Clean Water Act section 304(a), EPA is directed to develop and publish water quality criteria that reflect the latest scientific knowledge. Water quality criteria are based solely on data and scientific judgments about the relationship between pollutant concentrations and potential environmental and human health effects. EPA's recommended water quality criteria are not rules, nor do they automatically become part of a state's water quality standards. States must adopt into their standards water quality criteria that protect the designated uses of the water bodies within their area. These can include scientifically defensible site-specific criteria that are different from EPA's national recommended criteria, as long as the site-specific criteria are protective of the designated use. Water quality criteria are not effective under the Clean Water Act until they have been adopted into a state's water quality standards and approved by EPA.

2) What is Cadmium?

Cadmium is a relatively rare, naturally occurring metal found in mineral deposits and distributed ubiquitously at low concentrations in the environment. Cadmium's primary industrial uses are for the manufacturing of batteries, pigments, plastic stabilizers, metal coatings, alloys and electronics. Recently cadmium has been used in manufacturing nanoparticles (quantum dots) for use in solar cells and color displays.

3) How Does Cadmium Enter Surface Waters?

Cadmium enters the environment by natural and human processes, however, human sources, such as mining and urban processes, are responsible for contributing approximately 90 percent of the cadmium found in surface waters.

4) How Does Cadmium Affect Aquatic Life?

Cadmium is a non-essential metal with no biological function in aquatic life. Chronic exposure leads to adverse effects on growth, reproduction, immune and endocrine systems, development and behavior in aquatic organisms.

5) What Are the 2015 Draft Recommended Water Quality Criteria for Cadmium?

In the 2015 draft, EPA recommends:

- the one-hour freshwater acute criterion maximum concentration not exceed 2.1 µg/L.
- the four-day average freshwater chronic criterion magnitude not exceed 0.73µg/L.
- the one-hour estuarine/marine acute criterion maximum concentration not exceed 35 µg/L.
- the four-day average estuarine/marine chronic criterion magnitude not exceed 8.3 µg/L.

The recommended frequency of exceedance for the above is no more than once every three years.

6) How Do the Draft 2015 Criteria Compare to the Previously Recommended 2001 Criteria?

The draft 2015 updated criteria reflect data for 70 new species and 49 new genera. The draft 2015 freshwater acute criterion (2.1 micrograms per liter) for dissolved cadmium is approximately the same as the 2001 acute criterion (2.0 micrograms per liter). The draft 2015 freshwater chronic criterion (0.73 micrograms per liter) for dissolved cadmium is slightly higher (less stringent) compared to the 2001 criteria (0.25 micrograms per liter). These modest increases are primarily due to the inclusion of new toxicity studies. As in the 2001 criteria, the draft 2015 freshwater acute criterion was derived to be protective of endangered species and lowered further to protect the commercially and recreationally important rainbow trout. In addition, the duration of the 2015 acute criteria was changed to 1-hour. Both changes are consistent with procedures described in EPA's current aquatic life criteria guidelines.

The draft 2015 estuarine/marine acute criterion for dissolved cadmium (35 micrograms per liter) is slightly lower (more stringent) than the 2001 acute criterion (40 micrograms per liter), which is primarily due to the addition of new toxicity studies for sensitive genera. The draft 2015 estuarine/marine chronic criterion (8.3 micrograms per liter) is also slightly more stringent than the 2001 chronic criterion (8.8 micrograms per liter), due the consideration of more species in the chronic criterion development. Changes in suggested values between 2001 and 2015 can be found in Table 1 below.

Table 1. Summary of 2001 and 2015 Draft Aquatic Life AWQC for Cadmium.

	2015 AWQC Update		2001 AWQC	
	Acute (1-hour, dissolved Cd)[c]	**Chronic (4-day, dissolved Cd)**	**Acute (1-day, dissolved Cd)**	**Chronic (4-day, dissolved Cd)**
Freshwater (Total Hardness = 100 mg/L as $CaCO_3$)[a]	2.1 µg/L[b]	0.73 µg/L	2.0 µg/L[b]	0.25 µg/L
Estuarine/marine	35 µg/L	8.3 µg/L	40 µg/L	8.8 µg/L

[a] Freshwater acute and chronic criteria are hardness-dependent and were normalized to a hardness of 100 mg/L as $CaCO_3$ to allow the presentation of representative criteria values.
[b] Lowered to protect the commercially and recreationally important species (rainbow trout), as per the 1985 Guidelines, Stephen et al. (1985).
[c] The duration of the 2015 acute criteria was changed to 1-hour to reflect the 1985 Guidelines-based recommended acute duration.

7) What is EPA doing to help ensure these criteria protect threatened and endangered species?

The draft criteria document contains an analysis of the protectiveness of the draft criteria for threatened and endangered species using all available quality toxicity test data for species listed under the Endangered Species Act that have been tested for sensitivity to cadmium. EPA is also conducting a detailed analysis of the protectiveness of the draft criteria for endangered salmon to address the National Marine Fisheries Service concerns regarding the protectiveness of the acute cadmium criteria.

8) Is there litigation driving EPA's schedule for this updated criteria? What does the litigation entail?

The driver for updating the cadmium criteria was a lawsuit brought by Northwest Environmental Advocates (NWEA) following EPA's 2013 disapproval of Oregon's freshwater acute cadmium criterion. EPA's disapproval triggered a Clean Water Act duty for EPA to propose a replacement criterion

for Oregon. EPA intends to use the updated criteria document as the scientific basis a rulemaking to propose criteria for Oregon.

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have not changed significantly from 2001, a draft Endangered Species Act analysis prepared by EPA indicates that the updated freshwater criteria are expected to provide approximately 95 percent protection for acute exposure to endangered salmonids, a minimal effects level associated with the jeopardy opinion.

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